

An improved method in transient stability assessment of a power system using probabilistic neural network

ABSTRACT

This paper presents transient stability assessment of electrical power system using probabilistic neural network (PNN) and principle component analysis. Transient stability of a power system is first determined based on the generator relative rotor angles obtained from time domain simulation outputs. Simulations were carried out on the IEEE 9-bus test system considering three phase faults on the system. The data collected from the time domain simulations are then used as inputs to the PNN in which PNN is used as a classifier to determine whether the power system is stable or unstable. To verify the effectiveness of the proposed PNN method, it is compared with the multi layer perceptron neural network. Results show that the PNN gives faster and more accurate transient stability assessment compared to the multi layer perceptron neural network in terms of classification results.

Keyword: Transient stability assessment; Dynamic security assessment; Probabilistic neural network; Time domain simulation method; Artificial neural network